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SCIENCE NEWS-LETTER

The Weekly Summary of Current Science

A SCIENCE SERVICE PUBLICATION

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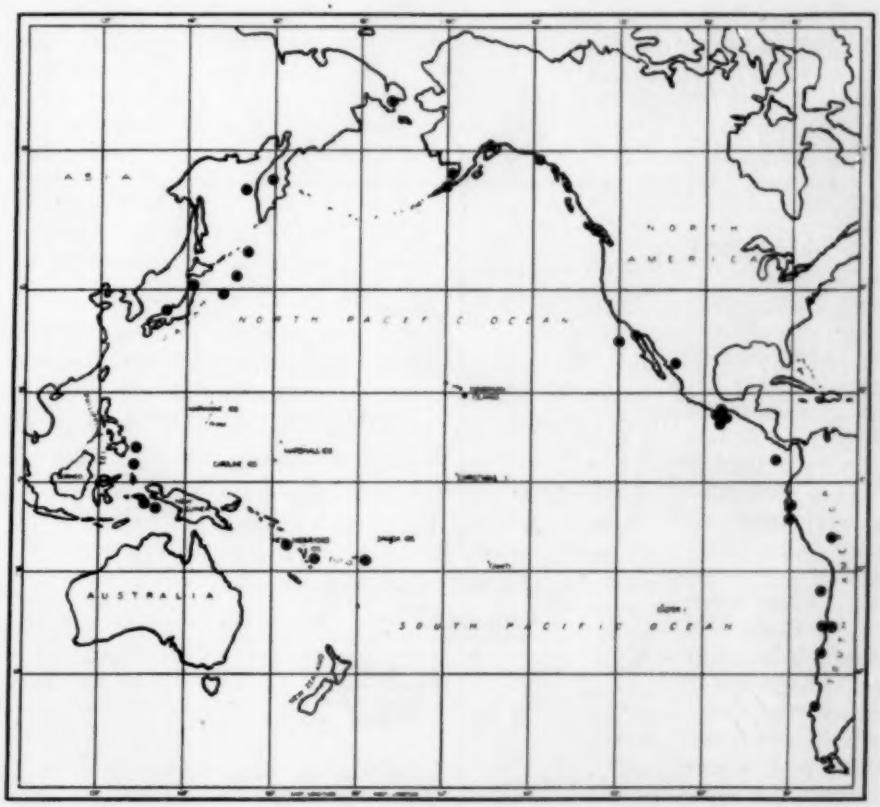

WHERE THE EARTH SHOOK IN 1928

Earthquakes Located With Science Service Aid

(See page 58)

Vol. XV *No. 408*

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Each pamphlet has 20 holes to punch

Germans Find Year's First Comet

Astronomy

The first comet of 1929 has been found by the same two astronomers who found a comet in November, 1927. These are Drs. Schwassman and Wachmann, of the Hamburg Observatory, in Germany, which is located at Bergedorf, a suburb of Hamburg. The announcement was made by Dr. Harlow Shapley, director of the Harvard College Observatory.

When the discoverers picked it up on Thursday, January 17, it was in the constellation of Taurus, which is now high in the southern sky each evening about 9 o'clock. This group of stars is characterized by the red star Aldebaran, and is just to the west of the familiar constellation of Orion. In the astronomical equivalents of latitude and longitude, the comet was in right ascension 5 hours 40 minutes and 32 seconds and declination 20 degrees and 30 minutes north. It was moving to the northwest and was of the eleventh magnitude, much too faint to be seen except with a large telescope.

Now it has been found that it is not a new visitor but a periodic one that returns to the region of the earth and sun once every six years and ten months. From the study of photographic plates of the comet made with one of the large telescopes at the Yerkes Observatory of the University of Chicago, Dr. George Van Biesbroeck and C. Y. Chang have computed its orbit.

Though the comet is still visible through large telescopes, it is receding from the earth and getting fainter, so that there seems to be no hope that it will become bright enough to be seen with the unaided eye. As it does not approach closer to the sun than two astronomical units, or twice the distance of the earth from the sun—about 186,000,000 miles—it is never likely to become a very striking comet.

Some of these photographic plates, on which the image of the comet was located, were made before its discovery by the Germans, but the comet had not been identified as such. Similar photographs were found in the files of the Harvard Observatory, some made nearly a month before its discovery.

While the comet came near the sun in 1922, and doubtless on earlier occasions as well, it appears that it has never been observed before. Probably this is due to the fact that on these previous visits it was not in a good position for observation, and so escaped even the vigilance of the astronomers who make a specialty of hunting for comets.

Science News-Letter, February 2, 1929

Earthquakes of 1928

Seismology

Whenever the earth trembles in any part of the world, the first thing the public generally learns, through the daily press, is that some seismograph station has recorded an earthquake at a certain distance. Sometimes the report might say that it appears to be in a certain general direction. A few hours later the papers carry a further report—that, with the aid of data gathered by Science Service by telegraph from perhaps a dozen or more different stations, sometimes as far separated as Manila, Sitka, Washington and San Juan, the U. S. Coast and Geodetic Survey has located the exact center of the quake. Perhaps, as in the case of one famous earthquake a few years ago, in the Kansu province of China, many months may elapse before actual reports from the damaged area reach civilization, though the earthquake itself sent its own message that enabled the experts to locate it within a few hours.

The map on the cover shows some of the most important earthquakes thus located during 1928, with the cooperation of Science Service, the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association, whose stations, at various Jesuit colleges, are among the best in the world. The black dots indicate the location of the quakes.

Science News-Letter, February 2, 1929

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INTERPRETING week by week, the latest developments in the various fields of science, this magazine attempts also to present its articles in the most pleasing and readable typography and the most convenient arrangement.

The *clippability, indexing,* and *automatic dating* of each article are unique features.

This is a *separable magazine.* Each original article can be clipped or torn out without losing or damaging another important article on the other side. These original articles are backed by reprinted quotations or excerpts, short one-sentence items, advertisements, and other material not likely to be clipped and preserved.

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All of the resources of Science Service, with its staff of scientific writers and correspondents in centers of research throughout the world, are utilized in the editing of this magazine.

Television, Though Crude, Has Arrived

Radiovision

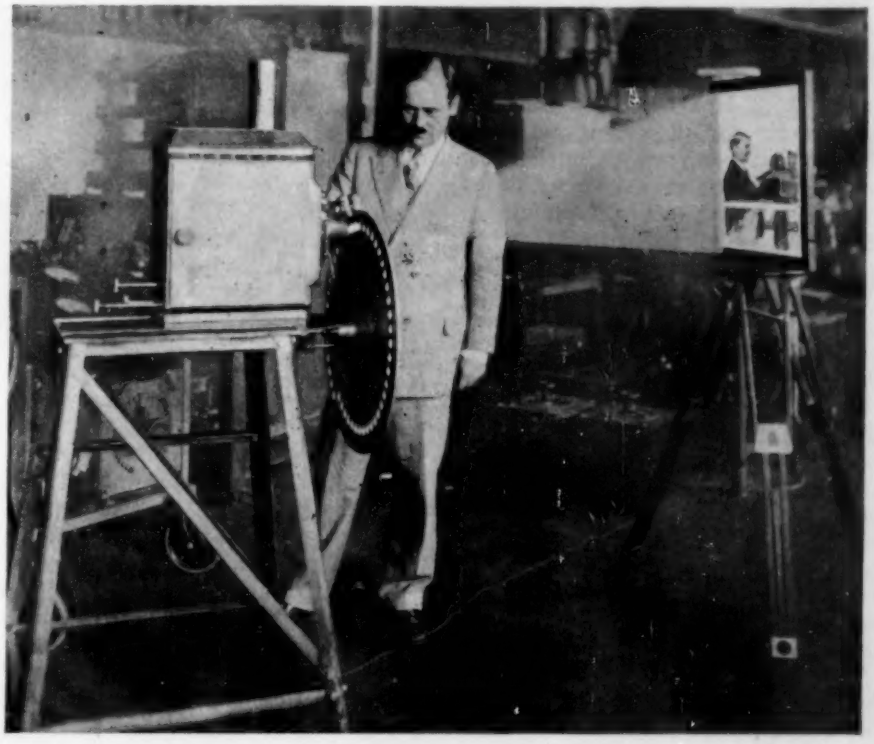
By James Stokley

Radiovision is here!

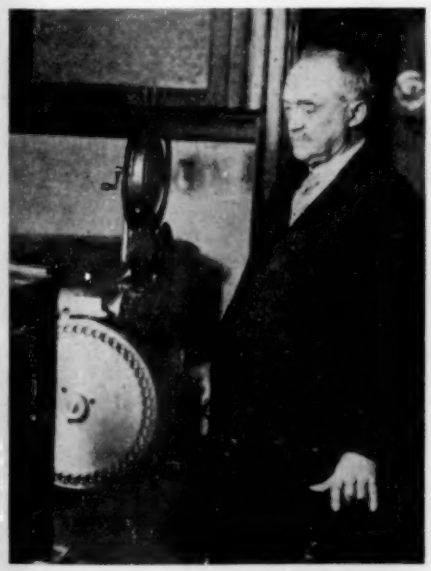
Despite the conflicting statements of cautious manufacturers, that seeing important events by radio is still a long way off, or of super-optimists that radiovision is now perfected, it has at least arrived. It has arrived just as much as sound broadcasting had arrived in the fall of 1920, when KDKA broadcast election returns that showed Harding was to be the next president of the United States, and followed this with daily concerts. Soon afterwards other stations were on the air, including WJZ and WOR.

At that time the relatively few people with receiving sets could pick up these programs, amid the squeals of other regenerative sets, and with the crude reproduction that was rendered with even the best of equipment.

The present status of television is almost identical. A half-dozen or so stations are now putting on regular programs. A number of amateurs in all parts of the country are now equipped with radiovisors, as the television receivers are called. Many more are making these receivers, just as in the broadcasting days of the early twenties they made their own sound receivers, because the present-day complete sets were not on the market.



DR. E. F. W. ALEXANDERSON, famous radio inventor of the General Electric Company at Schenectady, with the first experimental model of the apparatus for projecting television images to a screen. The artist has indicated how it might appear if used to receive broadcasts of Mr. Hoover's inauguration on March 4, a project that may actually be carried out.



C. FRANCIS JENKINS, Washington inventor, with the radiomovie transmitter that he used for regularly scheduled broadcasts over station W3XK since last July 2. Mr. Jenkins is now building a 5000 watt station, to be located on the outskirts of Washington, which will be in operation soon and is expected to cover a large part of the country.

Of course, present-day television is crude, just as 1920 broadcasting was crude, but the rate at which television is developing is much faster than was the development of broadcasting. It seems quite certain another year will bring a considerable degree of perfection. Probably never before has such a new thing come into being so rapidly. It was only in 1923 that the first moving shadows were sent across space by C. Francis Jenkins, Washington inventor. The same year the English experimenter, John L. Baird, succeeded in the same field.

By 1927 television had developed so far that on April 7, 1927, the Bell Telephone Laboratories gave the first satisfactory demonstration of seeing both by radio and over telephone wire. Secretary Hoover and other notables sat before a machine in Washington, and were seen and heard at the same time in New York, the connection being by the long-distance telephone lines. At the same time a group of entertainers in a New Jersey radio station were also seen and heard in New York.

Two of the latest television achievements have emanated from the research laboratories of the General Electric Company at Schenectady. One was the broadcasting of a complete playlet. The voices and faces of the characters, carried by radio, were heard and seen not only by groups of scientists and newspaper men around Schenectady, but by experimenters on the Pacific coast, 2300 miles distant. Another important development of the same organization had its debut to the public at the New York Radio Show, where, for the first time, an audience saw projected on a screen, just like movies, the life-sized images of people in another part of the building, at the same time hearing their voices.

So in five years television has developed from a dream of the future, thought by (*Turn to next page*)

Television, Though Crude, Has Arrived—*Continued*

many to be impossible of attainment, to a successful process, capable of being used commercially and regularly. Rapid as the rise of audible radio was, it was much slower than this. From 1896, the year of Marconi's first success over short distances, through 1902, when the first transatlantic radiotelegram was sent; 1914, when consistent radiotelephony was established over a distance of 18 miles; 1920, when broadcasting began, and up to the present, when daily conversations across the Atlantic by radio are taking place, and nation-wide broadcasting is a common occurrence, represents over thirty years. Of course, this radio development, in providing a channel over which to send television, has largely been responsible for the latter's rapid development. But, in view of the speed with which it has come into being, and present success, one would indeed be rash to predict that fully successful and perfected television for the home is still many years distant.

Though successful television is only about five years old, the idea is much older. In fact, a patent issued in 1884 described a method that is essentially the same as that now in use. The idea was sound enough and only the lack of modern equipment prevented it from working.

There are two possible ways of obtaining television. One is to imitate nature directly. This provided the original television transmitter in our own eyes! The lens of the eye forms an image on the retina, which consists of a mosaic of light-sensitive cells, called rods and cones. Each rod or cone is connected by means of a separate nerve fiber to the brain, through which the picture is sent. The scientist has light-sensitive cells also. These are the photoelectric cells which give off a minute electric current when light shines on them. This current can be amplified as much as desired and made to light a lamp. The most obvious method of televising is to use a bank of hundreds of photoelectric cells, connect each one by its own wire through an amplifier to a lamp in a corresponding bank. Then, if a lens forms an image of a scene on the photoelectric "retina", current will flow from the cells on which light falls, the corresponding lamps will light, and the picture will be reproduced. Such a system was actually experimented with nearly a quarter of a century ago, but the difficulty was with the huge number of elements and wires that would be needed to get a reasonably good picture.

A HOME RADIOVISOR like this will soon be on the market, according to promises. It is connected to the radio set in place of the loudspeaker or head phones, and makes use of a drum scanner, the invention of C. Francis Jenkins. The artist has indicated how it might look receiving a radiovision broadcast of Mr. Hoover's inauguration.

There is another method. It is to use a single light sensitive cell, and to pick up separate parts of the image in rapid succession with a photoelectric cell. This cell connects with a single light source, and by some mechanism corresponding to the transmitter, a moving spot of light, constantly varying in intensity, reconstructs the picture. Here only one set of wires, one photoelectric cell and one light is needed. The persistence of vision in the eye, by which we continue to see a thing for about a tenth of a second after it has disappeared, enables us to see a continuous picture, if it is repeated at least ten times a second.

The system used first in the Bell Laboratory's method, and now employed by the General Electric Company, and most of the other American stations broadcasting television programs, is a good example of the second method. If you have ever laid a piece of paper on a coin, then rubbed a soft pencil over the paper and obtained a reproduction of the coin, you are familiar with the way in which it works. The pencil traces a series of parallel lines. When it comes to a high spot on the coin, some of the graphite is rubbed off onto the paper, while in the low spots the pencil passes over lightly, and leaves no impression. When the coin has been completely covered, the long and short lines make up a picture reproducing the image on the coin.

In television a pencil of light takes the place of the one of graphite. A powerful source of light, such as an electric arc, shines on a disc, around the edge of which is a spiral row of holes. A lens forms an image of one hole at a time on the object whose image is being transmitted. Perhaps it is a face. When the disc turns this spot of light travels across the subject. Then the next hole comes into position, and another spot of light moves across the subject, just below the first. This is repeated perhaps 48 times, the 48 lines of light completely covering the subject. The light is reflected from the subject back to a photoelectric cell. When it encounters a light part of the face most of the light is reflected and a relatively large current flows from the cell. From a darker part there is less reflected light and so a smaller current from the cell.

The resulting current is amplified, then carried by wire or wireless to the receiving set. There it lights a special lamp, a neon tube. This glows with a pinkish light over an area a couple of inches square, and the light from the entire area fluctuates as the spot of light at the transmitter shines on lighter or darker areas. But still something is lacking to give a picture. This is a disc like the one at the transmitter, with the spiral row of holes. It turns in synchronism with the first one, and reveals a part of the luminous area corresponding to the part of the subject then lighted.

Such is television as it was first successfully demonstrated, as it is now being transmitted by numerous stations, and as thousands of amateur experimenters are (*Turn to page* 67)

5,000,000 Volt Artificial Lightning

Physics

How man is learning to out-Jove Jove by controlling the lightning, how radio is giving eyes to aviation in all kinds of weather, and how new Robots are permitting power stations to be controlled without any human attendance, were among the interesting subjects presented at the recent New York meeting of the American Institute of Electrical Engineers and here described.

Artificial lightning of 5,000,000 volts is now produced in the experimental lightning laboratory of the General Electric Company at Pittsfield, Mass., F. W. Peek, consulting engineer, told the American Institute of Electrical Engineers..

The previous record was 3,600,000 volts, but higher voltages are now obtained by the use of a radically new method which, in effect, throws into series four or more of the smaller lightning generators.

Full-size test sections of transmission lines, poles and electrical machinery are attacked by the artificial lightning to determine how apparatus in service can be protected from real lightning.

Mr. Peek and his fellow-engineers go hunting for actual lightning striking transmission lines and buildings during storms. By photographing the New York skyline during storms he discovered that a tall structure like the Woolworth Building will protect from lightning smaller buildings within a cone of which it is the center. This fact was first suggested by allowing lightning to play over model villages.

Even 5,000,000 volts is a mere fraction of the potential of the actual electrical discharges from clouds. The voltage of the usual lightning flash is about 100,000,000 volts at 100,000 amperes. This represents a thousand billion horsepower and an energy of four thousand watt-hours. And the whole performance is complete in a few millionths of a second.

Although most of us consider lightning an accompaniment of summer storms, thousands of electrical storms are in progress in various parts of the world continuously. Mr. Peek estimates that the total energy dissipated in the world by lightning is continuously 1,200,000 kilowatts.

Radio to Make Airways Safe

Radio beacons, marking the air routes of the nation, will soon make it possible for airplanes to fly safely in fog and passengers to rely on the timetables of the airways, Dr. J. H. Dellinger, chief of the radio section of the U. S. Bureau of Standards, predicted.

Dr. Dellinger told of a practical test of the radio beacon developed in his laboratory. The day was misty and the weather charts read "low visibility." The pilot who had never flown the route was relieved of all his maps. His only instructions were to fly from Philadelphia to Washington, using as his guide the radio beacon. The beacon-indicator led him accurately to the College Park Field outside of Washington, the sudden deflection of his indicator told him his journey was ended and he landed safely on a field he had never seen.

How Beacon Works

"The directive radio beacon is a special kind of radio station, usually located at an airport, just off the landing field," said Dr. Dellinger. "Instead of having a single antenna like an ordinary station, it has two loop antennas at an angle with each other. Each of these emits a set of waves which is directive; that is, it is stronger in one direction than others. When an airplane flies along the line exactly equidistant from the two beams of radio waves, it receives signals of equal intensity from the two. If the airplane gets off the line it receives a stronger signal from one than the other.

"The indicator on the instrument board of the airplane shows when the signals from the two beams are received with equal intensity, by means of two small vibrating reeds. When the beacon signal is received, the two sets vibrate. The tips of these reeds are white in a dark background, so that when vibrating they appear as a vertical white line. The reed on the pilot's right is tuned to a frequency of 65 cycles and the one on the left to 85 cycles. It is only necessary for the pilot to watch the two white lines produced by the vibrating reeds. If they are equal in length, he is on his correct course. If the one on his right becomes longer than the other, the airplane has drifted off the course to the right. If he drifts off the course to the left, the white line on the left becomes longer. Thus if the pilot leaves the regular course either accidentally or to avoid stormy area, the radio beacon will show him the way back.

"The whole receiving system comprises a small indicator unit on the instrument board weighing one pound, a receiving set weighing less than 10 pounds, and a 10-pound battery. The same receiving set can be used to receive radiotelephone messages, by plugging in a pair of headphones. The receiving system is very little affected by interference, including static, other radio stations, and airplane igntion interference, which has hitherto been the bar to satisfactory use of radio on airplanes.

"The beacon stations will probably be placed at airports in general averaging about 200 miles apart. The Airways Division of the Department of Commerce Aeronautics Branch has begun a program of installing them on the various airways. The directive beacons, with a straight airway between them, will be supplemented by small marker beacons at intervals (perhaps 20 miles) along the route. These are simply very low-power radio transmitting stations serving as mileposts. A characteristic signal from a marker beacon will show on the visual indicator aboard the airplanes when that point is being flown over."

Cable Could Guide Ship

The traditions and principles of water navigation were criticized by Robert H. Marriott, consulting engineer of the Federal Radio Commission, who pointed out that although an electrical cable could be laid in New York harbor that would allow a blindfolded helmsman to follow the channel, such a device is not used.

"Such a device has been proposed time and time again and our Navy spent a great deal of money in demonstrating its practicability," Mr. Marriott declared before the institute.

The channel marking device is comparatively simple, Mr. Marriott said. The transmitter includes a single conductor cable laid in the bottom of the channel, through which alternating current of say one thousand cycles is conducted to its outer end which is grounded. The receiver on a steel vessel includes two flat coils of wire hung on the port and starboard sides of the ship, parallel to the ship's sides and connected to two head phones or other indicators. When the keel of the ship is steered directly over the cable the responses from the two coils will be equal. When the ship gets off on the starboard side the greatest response (*Turn to next page*)

5,000,000 Volt Artificial Lightning—*Continued*

will come from the port-side coil and vice versa. until the ship is brought back to where it should be.

He also urged that submarine sound beacons and radio beacons be utilized to a greater extent in navigation. Using an echo to tell the depth of the ocean is another navigational method that should be more widely used.

Aviation is using modern navigational methods more widely than sea navigation. Mr. Marriott described the radio compass, the earth inductor compass, the radio beacon, and the newer methods of finding the altitude of an airplane above the ground.

New Switching Device

A new type of circuit breaker for use in switching the large amounts of electricity on transmission lines was described by engineers of the Westinghouse Electric and Manufacturing Company.

Large circuit breakers now in use usually require oil tanks for insulation and gradually reducing the flow of the current during the switching operation. The new deion breaker is oil-less and, as its name indicates, it operates by deionizing the arc. The current is allowed to arc and is then drawn over metal plates sufficiently fast to prevent burning them. The one large arc is broken up into a large number of short arcs and finally the arc streams between the two conductors are deionized and turned into a barrier to the current.

In 82 tests there were only two failures of the new circuit breaker to function properly, B. G. Jamieson of the Commonwealth Edison Company of Chicago reported. Dr. Joseph Slepian, research engineer, and R. C. Dickinson and B. P. Baker, Westinghouse engineers who participated in the development, described the theory and possibilities of the deion circuit breaker, at present applicable to currents up to 15,000 volts and 2,000 amperes.

Manless Power Plants

Power stations that run themselves and are watched by electric eyes that record their impulses miles away were described by a group of General Electric Company engineers to the meeting.

"Automatic performance has been applied extensively during the recent years to the generation, transmission and distribution of electrical energy," said the report. "Automatic devices and equipments are very satisfactorily performing duties that were performed only a few years ago by operators. A large number of men heretofore performing important but minor duties have been released for more active and responsible positions."

To control the automatic machinery from a central point it is necessary to transmit to that point the readings of instruments.

In the future television may come to the aid of the electrical dispatcher by allowing him to look at the dials of instruments far distant from his post. But at present watching remote electrical stations by television is too costly and not practical.

A new technic of "telemetering" has developed as a result of the need of remote control. Over the transmission lines themselves, special cables or telephone lines, signals are sent to a central point and duplicate on dials and in records the reading on the instruments in the manless power plants.

Noise in Household Machinery

Noise in vacuum cleaners, electric refrigerators, motors and other household equipment is being attacked by research engineers of the Westinghouse Electric and Manufacturing Company. Thomas Spooner and J. P. Foltz explained some of the causes of annoying sounds from street railway motors and other electrical apparatus that sometimes disturb the peace of communities.

In their tests the engineers cannot rely on human ears to diagnose the noisy ills of machinery. A sound analyzer picks up sound of a given frequency, amplifies it, "listens" to it, and records its share in the "noise" on an electrical instrument.

Most of the noises in small electric motors are caused by gears, the sound of the rotating parts in air, and the vibration of the frames.

Magnetism Tests Metals

Magnetism, working silently without injuring metal, is a testing tool coming more and more into industrial and research use, Raymond L. Sanford, chief of the magnetic section of the U. S. Bureau of Standards, told the American Institute.

Case-hardened chain, heat-treated forgings and steam turbine bucket wheels are among the products now given a routine magnetic analysis to detect flaws and insure quality.

In exploring the qualities produced by new steel treatments, in determining the changes that take place during the cooling or heating of a ferrous alloy, magnetic analysis is used by scientists investigating the properties of materials.

Inspection of welds is facilitated by magnetic methods. Since welding is coming into larger industrial use, the magnetic test will facilitate the control of this modern method of joining metals together.

Edison Medal Presented

Dr. Frank B. Jewett, who as president of the Bell Telephone Laboratories has directed important research in telephony, was presented the Edison medal by the American Institute of Electrical Engineers.

The Edison medal is awarded annually and was established by associates and friends of Thomas A. Edison. Previous awards have been to such electrical leaders as Elihu Thomson, George Westinghouse, Alexander Graham Bell, Nikola Tesla, John J. Carty, W. L. R. Emmet, Robert A. Millikan, Michael I. Pupin, and William D. Coolidge.

Dr. Jewett is also vice-president of the American Telephone and Telegraph Company in charge of development and research.

Science News-Letter, February 2, 1929

Publicity or Secrecy

Psychology

G. K. CHESTERTON, in *The Illustrated London News*:

Essential secrecy has rather increased than decreased in the last few centuries. I know there is a general impression to the contrary, because of the wide space occupied by things like advertisement and publicity. But this is to misunderstand the very nature of these things. Publicity is not the opposite of secrecy. Publicity often means only the public praise for a secret process. It means the enlargement of trade marks, but not the diminishment of trade secrets.

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The United States had more cases of smallpox this year than any other country reporting this disease, except India.

A goiter survey in Oregon shows that 36 per cent. of the girls have enlarged thyroids as compared with 22 per cent. of the boys.

New German "Surprise Ships"

Engineering

The cruiser debate now raging in Congress has had a new angle suddenly introduced by the disclosure of details concerning a new type of German ship now building, which has just become known here. The *Ersatz Preussen,* first of a group of four to be built, represents enormously more hitting power than has ever been crowded into a 10,000-ton ship by the naval architect of any other nation. It is not unlikely that a complete revision of the specifications of the 10,000-ton "treaty cruiser" type will have to be made in answer to this latest stroke of the German Admiralty.

The *Ersatz Preussen* carries as her main battery six 11-inch guns in two three-gun turrets, supplemented by eight 5.9-inch guns to repel torpedo attacks and four 3.4-inch anti-aircraft guns. She also carries six 19.7-inch torpedo tubes on two triple mounts.

The appearance of a ship carrying guns as heavy as 11-inch, in a class where the conventional armament has been 8-inch or less, is a peculiar result of treaty restrictions. By the terms of the Versailles treaty Germany was forbidden to build any battleships or battle cruisers, and the size of such warships as she might construct was limited to 10,000 tons—less than a third of the displacement of modern capital ships. But nothing was said about the caliber of the guns such ships might mount. Their small displacement would of course preclude an armament of 14 or 16-inch pieces, such as post-war superdreadnaughts carry.

Then, at the Washington conference, the signatory powers agreed not to build any cruisers of more than 10,000 tons. They limited themselves also to guns of 8-inch caliber. These restrictions will remain in force until 1931.

The typical post-conference cruiser, as built by Britain, Japan and France, mounts eight 8-inch guns, though tentative plans for the American ships provided for in the 15-cruiser bill call for nine. By sacrificing armor, fuel or machinery, enough weight might be gained to raise the battery to ten 8-inch guns. But that would be about the limit for a 10,000-ton cruiser.

The new German ship will be able to throw from her six 11-inch guns a broadside totaling nearly 4,000 pounds, for each 11-inch shell weighs 662 pounds. Eight 8-inch guns, with shells weighing 260 pounds apiece, could answer this with a broadside of not much over 2,000 pounds, and a ten-gun cruiser would have only a 2,600-pound broadside.

Thus, broadside for broadside, the German ships would have the post-conference cruisers outgunned nearly two to one. The 8-inch gun can be fired faster, thus cutting down the discrepancy somewhat; but against this must be balanced the long range of the German 11-inch gun, which is reported to have an extreme reach of 30,000 yards. The chances are that in an engagement between one ship of this new type and two post-conference cruisers the German could hammer her opponents to pieces while they were endeavoring to close in to a range where their own 8-inch guns would be effective.

The engineering features of the *Ersatz Preussen* are said to be as remarkable as the power of her battery. Weight was saved wherever possible by the use of light-metal alloys and the highest grade steels. This effected an economy of some 550 tons, a saving of 5 per cent. on the capital of 10,000 tons displacement. The new ship will be driven by internal combustion engines of a new and radical type, developing a unit of horsepower for every 17½ pounds in weight, as against one horsepower for every 55 pounds in the best type of internal combustion marine engines now commonly known. Details of the new type of engine have not yet been made public.

The speed of the *Ersatz Preussen* is to be 26 knots, and the German Admiralty states that she will carry enough fuel to make a continuous voyage of 10,000 miles at 20 knots. The most efficiently engined of present cruisers can travel that far, but only at the much lower speed of 13 knots. What the German ship could do at that speed is not known, but it has been estimated that she might cruise 18,000 miles, or almost three-fourths of the circumference of the earth.

The naming of the new type of warship is presenting a puzzle. She is much too small to be called a battleship and too heavily gunned to be called a cruiser. The German Admiralty has called her simply an "armored ship," and let it go at that.

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Ship Feels Bumps Over Quake

Seismology

Sailing over an earthquake that was sufficiently severe to be felt by seismographs throughout the world was the experience of a British ship, the Magalda, that has just been reported to the Hydrographic Office of the U. S. Navy.

Capt. W. S. Smales, the steamer's commander, reported that on December 1, while enroute from Talcahuano to Tocopilla, Chile, they felt three heavy bumps as if the vessel had struck bottom. Their position was latitude 35 degrees 33.5 minutes south and longitude 72 degrees 54 minutes west, where the charts show a depth from 400 to 600 feet. Careful examination showed that no damage was done.

As announced by Science Service at the time, the center of the quake was 35 degrees south and 74 degrees west, not more than 60 miles away from the Magalda's position. According to Commander N. H. Heck, in charge of the Coast and Geodetic Survey's earthquake investigations, the ship must have been very close to the center, or it would not have been felt as it was. The three bumps, he thinks, were due to three separate shocks, of which probably only one was severe enough to set up the earthquake waves which traveled around the earth and permitted the seismologists to locate it when they were received on the seismographs.

Science News-Letter, February 2, 1929

Eight Mountain Lions

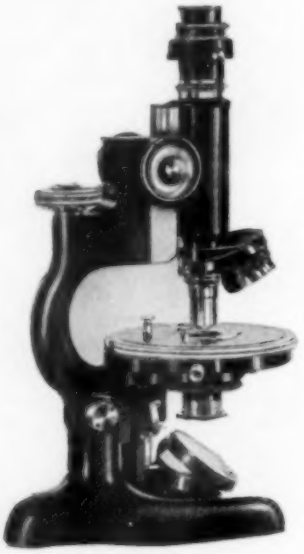
Zoology

Chief Ranger Donal J. Jolley of Zion National Park recently surprised a group of eight mountain lions up on the east rim of Zion Canyon, coming as close as 40 feet to some of the animals before he saw them. The ranger was quite as surprised as the lions, which lost no time in disappearing into the thick brush.

Superintendent E. T. Scoyen of Zion Park, who has spent practically all of his life in one national park or another, states that he has never yet seen a mountain lion running at large. He considers Mr. Jolley's experience in meeting not one but several of them very unusual.

Science News-Letter, February 2, 1929

The Chemist's Right-Hand Man



The various types of work peculiar to a chemist demand a microscope possessing all of the characteristics necessary to perform such work. The chemist will find the New B. & L. Chemical Microscope able to answer all of his requirements.

The base, pillar and arm have been redesigned to give more room for the manipulation of the specimen and instruments.

Another feature, the revolving nosepiece containing three objectives, enables a quick change of magnification.

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Bausch & Lomb Optical Company

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Our Greatest Mystery

Psychology

WILLIAM A. WHITE in *An Introduction to the Study of the Mind* (Nervous and Mental Disease Pub. Co.):

It has seemed to me that the outstanding fact of man's progress in the last one hundred years, or even less, has been the tremendous increase in his knowledge of his environment and his control over it. Meanwhile there has been no corresponding advance in the knowledge of his most important asset, his mind or the mind of his fellows. It is a common, everyday experience, heralded in the daily press for all who have the eyes to see it, that men contact with each other in their efforts to solve problems of large or small importance, and frequently have not the slightest notion of how the other fellow is thinking or what he means. They remain incomprehensible to one another and yet it seems never to occur to anyone to examine into the way in which the mind of each, as a complex machine, has worked over these problems and determine how it has come at the particular solution at hand. *Man remains the greatest mystery to man.*

It is an open question whether our present cultural state has not exhausted the method that has brought it to pass. We know, in the history of science, that new discoveries, new methods often produce great and rapid progress but that the potentialities of these discoveries and methods are finally exhausted and progress waits on new ones as impetus to further advance. This may easily be the case today with our social system in its varying ramifications, and I venture the suggestion that the most important single direction inquiry could take to insure further progress would be to devote as earnest study to the nature and mechanisms of the human mind as has been devoted in the past to the study and the elaboration of our environment. Surely the instrument with which all progress to date has been brought to pass is as worthy of study as the result of its uncontrolled activities to the end that if it were better known its results could be made more valuable.

This problem of man's understanding and control of himself and of his fellows is a problem in *human engineering* and is, I take it, the most ambitious task of engineering ever undertaken.

Risked Life to Prove Theory

Medicine

Dr. Joseph Goldberger, hunger fighter, surgeon of the U. S. Public Health Service, has lost his last fight against disease. He died at the Naval Hospital on January 17, following an illness of several weeks. Dr. Goldberger did not succumb to pellagra, as reported erroneously in some accounts of his death. Sarcoma that had spread throughout his system was the cause of his death.

This modest, unassuming man saved thousands of lives and untold suffering among others, but he was unable to save his own life. Many times Dr. Goldberger risked his life, even courted disease and death for the sake of his fellowmen. This time disease came uncourted and death followed despite all the efforts of fellow scientists and his colleagues of the U. S. Public Health Service.

Dr. Goldberger was born in Austria-Hungary in 1874, coming to this country with his parents at the age of 6. Brought up in New York's lower East Side, this immigrant lad achieved the greatest public health research of any country within the last generation. His connection with the U. S. Public Health Service started just twenty years after his arrival in the Promised Land, to which he contributed so much. His first work was the examination of immigrants at Ellis Island. Routine duty at other immigration stations and U. S. consulates followed. However, his unusual qualifications for research work were soon recognized and in 1904 he was attached to the Hygienic Laboratory at Washington. His connection with this branch of the service continued until his untimely death.

Dr. Goldberger's greatest contribution to science and to humanity was the discovery of the cause, cure and prevention of pellagra. This disease was not recognized in our country until 1907, but it had been known in Europe for hundreds of years. Other scientists had theorized and looked for germs and written countless treatises on the subject to no avail. Dr. Goldberger's love of humanity detected the clues which led to the solving of this distressing public health problem.

Science News-Letter, February 2, 1929

Chemical Shorthand System Devised

Chemistry

A new system of chemical shorthand, which promises to be a time saver for stenographers and reporters who take chemical dictation, has been developed by Louis A. Leslie of New York City and Dr. C. A. Jacobson, professor of chemistry at West Virginia University. Thoroughly mastered, this system saves time and makes for greater accuracy in reporting.

Dr. Jacobson listed the names and symbols of all the chemical elements, as well as the acid radicals occurring in all but the most complex inorganic compounds, and he suggested that a distinctive shorthand character for each be made, in order to simplify their writing.

For the chemical elements and the initial set of radicals this has now been eccomplished by Mr. Leslie. The Gregg shorthand character which has been ascribed to each is not only distinctive but easy to write, so that the salt obtained by the combination of any two of them may be represented by two characters instead of several as heretofore. For example, if a stenographer were obliged to write magnesium pyrophosphate, ammonium thiomolybdate, or praseodymium thioaluminate he could do so by two simple characters for each instead of by four or more rather complex ones.

The lists thus far prepared cover the names of thousands of inorganic compounds, yet when the system is complete it will include the characteristic nomenclature in all the different fields of chemistry. It will also include shorthand characters for the numerous syllables, prefixes, and suffixes found in chemical nomenclature.

The chemist is now employing a well established system of shorthand to represent the names of elements by one or two letters called symbols, and compounds by small groups of these symbols called formulas, Prof. Jacobson explained. He also represents chemical reactions by equating the formulas representing the compounds reacting with the formulas of the compounds produced. The present proposed system of chemical shorthand goes still further by abbreviating the chemist's abbreviations.

Science News-Letter, February 2, 1929

Nature Ramblings

By Frank Thone

Natural History

99

A Poor Weather Prophet

Winter will last six weeks longer. We shall have an early, pleasant spring. The coming of spring is a matter of doubt; it may be soon or it may be late.

All three of these propheries are equally good, and they were all made by the same prophet in different parts of the country. For in places the day was clear, so that the groundhog saw his own shadow. Elsewhere it was cloudy, so that he didn't see it. And in still other localities the weather was partly cloudy, so that we don't know whether he saw the shadow or not.

As a matter of fact, even where he saw his shadow plainly, it's only an even-money bet that he was right and where he didn't see it at all the same odds hold. Meteorologists who have made a statistical examination of the weather records for years back have found that there is no discernible correlation between the state of the sky on February 2 and the state of the weather for six weeks thereafter.

Anyway, the groundhog doesn't care at all about the wagging heads or the arguing tongues. He's getting in the last sound licks of his beauty sleep, which began some time last fall. And he'll come out, shadow or no shadow, when he gets good and ready, and not before.

The groundhog is the same animal we call the woodchuck. He has another alias, marmot, which has been adopted as his scientific name, latinized into *Marmotus*. There are three main species of him on this continent, split up into numerous subspecies by naturalists who know their groundhogs. The lowland species are, respectively, the common or red-haired marmot and the yellow-bellied marmot. Up in the Rockies there is a bigger animal, the hoary marmot or rock-chuck, which lives in among the tumbled rocks on (*Turn to next page*)

Groundhog—*Continued*

the mountains instead of in burrows underground.

The groundhog, of course, is in no way related to the squealing denizens of the pigpen. He is a cousin of that misnamed animal, the guinea-pig (which isn't a pig and never saw Guinea), and both of them are rodents. The groundhog, as a matter of fact, is simply a great big, oversized, short-tailed squirrel that prefers to dive into the ground for safety instead of climbing a tree.

Science News-Letter, February 2, 1929

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Frederick on Science

General Science

JOSEPH NEEDHAM in *Man a Machine* (Norton), quoting from the works of Frederick the Great:

"The majority of priests read literary works as if they were all treatises of theology; filled with this alone in mind, they see heresies everywhere, and thence spring so many false judgments, silly accusations, and complete misunderstandings. A medical book ought to be read with the outlook of a physician; Nature, Truth is his judge, she alone can absolve or condemn him. A book of astronomy must be read in the same manner. If some modest physician proves that a heavy blow on the head with a stick disarranges the mind, or that at a certain degree of external heat the reason is upset, one must either prove the contrary or keep one's mouth shut. If some clever astronomer shows, in spite of Joshua, that the earth and the celestial globes turn round the sun, one must either calculate better than he or suffer in patience the fact that the earth behaves in such a manner."

Science News-Letter, February 2, 1929

Is There a "Jewish Type"?

Ethnology

FRIEDRICH HERTZ, in *Race and Civilization* (Macmillan):

Fischberg, after an intense study of the racial features of the living generation of Jews, came to the conclusion that there exists no such thing as one homogeneous Jewish type, but that there is a multitude of Jewish types, according to the nations among whom the Jews live and to whom, to a higher or lesser degree, they have assimilated. The German Jews are much more like the other Germans than they are to their coreligionists in Palestine. The similarity appears in the head form, the proportions of the body, pigmentation, and facial traits. And even in Jerusalem, a census taken of the Jewish children there showed that among the Aschkenazim there were 40 per cent. blonds and 30 per cent. blue-eyed, and among the Sephardim 10 per cent. blonds and still less blue-eyed, only the decidedly blond or brunet tints having been taken into account.

The census of school children in Germany, taken under the auspices of Virchow, revealed that among 75,000 Jewish children 32 per cent. had light hair and 46 per cent. light eyes. In Austria the proportion was 28 and 54 per cent. respectively, in England 26 and 41 per cent. and so forth. The purely brunet type has been preserved only by about half of the European Jews, while about 10 per cent. are pure blonds (fair complexion, light eyes and hair), the rest being of mixed racial features. As to noses, Fischberg, after examining 4,120 individuals, found out that but a small minority of Jews are blessed with olfactory organs of a crooked form, but it is just this small number of crooked noses which strike the eye, and not the large number of straight ones. A straight ("Greek") nose was found in 57 per cent. of the males and 59 per cent. of the females. Crooked noses were noted in 14 per cent. and 13 per cent. respectively. From this we may learn how unreliable popular ideas respecting racial types are. The fact is, that many of the traits commonly believed to be Jewish characteristics are in reality of the most diverse derivations.

These traits, moreover, are by no means restricted to the Jews, but are met with in a great many other peoples, a fact which has given rise to the manifold speculations respecting the whereabouts of the lost Ten Tribes of Israel. Peculiarly striking is the occurrence of Jewish types among the higher classes in Japan, even among the Imperial Family. One of the finest ladies of Tokio would be regarded in Europe as of Jewish blood (Ranke). The present King of Spain strongly reminds one of certain caricatures of Jews in our comic papers; in surveying the ancestral portraits of the House of Hapsburg one finds Jewish traits in a surprising multitude. A prominent German anti-Semite, Theodor Fritsch, detected Jewish types even among the Hohenzollern family. Like similarities seem patent in pictorial representations of the Incas of Peru, in some princely families of Java, in many German and French aristocratic families of the oldest standing, in Dutch patrician families, and furthermore, among many primitive races such as the Bakairis of South America, the Kaffirs of South Africa, the Papuans, some Polynesian and Micronesian and North American Red Indian tribes, etc. Stratz, from whom some of these statements are taken, therefore declares that Jewish appearance is the effect of protracted inbreeding, as indeed practised in ruling dynasties, castes, and aristocratic families, and also in areas of local isolation (e. g. small islands, forests, the Ghetto). It was the absence of crossings which, according to this author, developed in the Jews the characteristics of the white race to an extreme degree.

The fact that we nearly always can tell a Jew at a glance from other people seems very often due not so much to physical as to psychical and social characteristics, such as name, bearing, manner of speech, ocular expression, etc. That the outward appearance is influenced also by the mode of life becomes visible from the following instance given by Luschan: In the isle of Rhodes the Jews have monopolized for some 400 years the profession of porters, so that on Saturdays no ship can unload her cargo. The result has been that the Jews of Rhodes to-day count among the tallest people, their average stature being, he says, nearly as tall as that of the Scotch, and surpassing that of the Swedes. He sees in this an effect of unconscious selection.

Science News-Letter, February 2, 1929

Television, Though Crude, Has Arrived—*Continued*

receiving it. But it still leaves a lot wanting. For one thing, the receiving process is extremely inefficient. The entire area of the neon tube, perhaps three square inches, is lighted, but only the light which shines through a hole about a twenty-fifth of an inch can be seen at once. The result is that about 249/250ths of the light is wasted. Whenever the scientist sees waste it makes him feel badly and so he has sought for ways to use more of the light from the neon tube.

One way of doing this, which points the way to the time when we shall see televised programs on the screens of motion picture theaters, is the invention of Dr. D. MacFarlan Moore, of the General Electric Laboratory. This was the method demonstrated at the New York Radio Show. He uses a neon light, but one of his own invention, and in which the light is concentrated in a spot about the size of a pinhead. Revolving in front of it is a disc containing, instead of a spiral row of holes, a spiral row of lenses, the invention of C. Francis Jenkins, of Washington. Each lens forms an image of the light spot on the screen as it comes into position. First one lens sweeps across the field, and the spot of light on the screen crosses in a corresponding manner. Then the next lens comes into position, and the next spot appears as a line of light on the screen, below the first. Finally, all 48 lines have crossed, and the entire picture area has been covered, then the whole process is repeated 15 times a second. With the light spot varying according to the brightness of the original, the head of the subject is reproduced plainly and life-size. So far, it has not proven possible to make the light brilliant enough to give a picture larger than a couple of feet square, but this will doubtless be done before long, and images can be made to cover the entire area of a large motion-picture screen.

Still another method of increasing the light is now being tried out by C. Francis Jenkins. This discards the neon tube altogether, and makes use of incandescent lamps. The image is seen on a screen made of 2304 small flashlight lamps, forming a square with 48 on a side. Each lamp is connected with a revolving contact called a commutator. This spins around like the scanning disc, connecting each lamp in succession, and each lamp lights according to the brightness of the corresponding parts of the subject. But after the commutator has passed, the lamp continues to glow for an instant, until the connection is made again a 15th of a second later. Under similar circumstances, a neon light would only shine while it was actually connected, or 1/2304th of the total time. The lamps would not give the full theoretical advantage, of 2304 times as much light as the neon, unless the lamp continued to glow at full brilliancy for a fifteenth of a second, then went out instantly. Actually, they start to diminish as soon as the current is off, but do not completely darken until an instant later. However, there is still a great advantage, and, as the incandescent lamp is intrinsically much brighter, the image will be many thousand times as brilliant. So far, this idea has not been tested in operation, and until it is its success is conjectural. But at least it indicates what may be expected. And with this brilliant picture, a lens can be placed in front of the glowing bank of lamps, and an image projected on a large screen.

So with all these developments already accomplished and with others around the corner, there is no doubt that radiovision is "here". Perhaps the 1929 world series games will be broadcast to televisors as well as by sound; the same may even be true of the inauguration ceremonies that will take place on the steps of the United States Capitol in Washington on March 4. Or possibly the first important television broadcast may be a little later. But that it is coming, and within the next few years, there is no longer any possible doubt.

Science News-Letter, February 2, 1929

WHAT TO SEE BY RADIO

Stations on Regular Schedule

LEXINGTON, MASS., W1XAY, Lexington Air Station, 300 watts, 4800-4900 kc. or 62 m. Standard scanning.* Daily, 3 to 4 p. m., and 7:30 to 8 p. m. Will soon be equipped to broadcast voice and vision simultaneously.

PITTSBURGH, PA., W8XAV, Westinghouse Electric and Manufacturing Co., 2000 watts, 4700-4800 kc. or 63 m. 20 frames per second, 60 lines per frame. Transmitting television programs, generally motion picture films, Monday, Wednesday and Friday, 5:10 to 6 p. m., Eastern Standard Time.

SCHENECTADY, N. Y., W2XAF and W2XAD, General Electric Co., 24 lines, 20 frames per picture. Sunday, 11:15 to 11:45 p. m., W2XAD, 19.56 meters or 15340 kc. Tuesday, 12 to 12:30 p. m., W2XAF, 31.48 m. or 9530 kc., Tuesday, Wednesday and Friday, 1:30 to 2 p. m., W2XAD.

WASHINGTON, D. C., W3XK, C. Francis Jenkins, 250 watts, 6415-6425 kc. or 47 m. and 1600-1610 kc. or 187 m. Standard scanning.* 8 to 9 p. m., Eastern Standard Time, Monday, Wednesday and Friday. Radiomovies.

On Irregular Experimental Schedule or Under Construction

BEACON, N. Y., W2XBU, H. E. Smith, 100 watts, 4500-4600 kc. or 66 m. Standard scanning.* (Under construction.)

CHICAGO, ILL., W9XAA, Chicago Federation of Labor, 500 watts, 4560 kc. or 66 m. Standard scanning.* "At present standing by awaiting sanction from Federal Radio Commission."

LONG ISLAND CITY, N. Y., W2XBT, Frank L. Carter, 8190-8200 kc. or 36.6 m. Irregular nightly experimental broadcasts.

LOS ANGELES, CALIF., W6XC, Pacific Engineering Laboratory Co., 500 watts, 4500-4600 kc. or 66 m. Will start on definite schedule within next six weeks.

MEMPHIS, TENN., W4XA, WREC, Inc., 5000 watts, 2400-2500 kc. or 122 m.

NEW YORK, N. Y., W2XBW, Radio Corporation of America, 5000 watts, 15100-15200 kc. or 20 m. The corporation also has been granted construction permits for W2XBV, 4500-4600 kc. or 66 m. and for W2XBS, 4600-4700 kc. or 64 m.

NEW YORK, N. Y., W2XAL, Experimenter Publishing Co., Radiovision broadcasting suspended pending hearing by Federal Radio Commission.

WASHINGTON, D. C., C. Francis Jenkins, 5000 watts (under construction).

*Standard scanning refers to the standard adopted by the Radio Manufacturers Association. This is 48 lines per picture, 15 frames per second, with scanning consecutive from left to right and top to bottom as one reads the page of a book.

The population of Melbourne, Australia, has reached one million.

A huge variety of lemon sweet enough to be eaten with a straight face has been developed in Porto Rico.

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QUARTERLY REVIEW OF BIOLOGY.

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¶ By HENRY CREW. A human document despite the fact that it deals with the stuff of which worlds are made. Beautifully bound and illustrated, it is quite clearly a book for the "culture shelf." But plenty of information in it, too. The author's style is particularly engaging. $5.00.

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N. E. JOURNAL OF MEDICINE.

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The National Children's Bureau of Italy is planning to arrange for vaccination of newborn babies against tuberculosis, when their parents desire it.

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FIRST GLANCES AT NEW BOOKS

HYDRAULIC LABORATORY PRACTICE—Edited by John R. Freeman—*American Society of Mechanical Engineers* ($10). This is the monumental foundation for experimental hydraulics. To the editor, who in 1924 visited the hydraulic laboratories of Europe, who has since repeatedly emphasized the great engineering and financial savings that will come from intelligent experimentation with models, who inspired and assured the publication of this volume, the public that will benefit from its content owes a great debt. By first building great river structures on a small scale, European engineers have placed their hydraulic engineering on an experimental instead of an empirical basis. They have set an example for America.

Hydraulics
Science News-Letter, February 2, 1929

SKYSCRAPERS AND THE MEN WHO BUILD THEM—W. A. Starrett—*Scribner's* ($3.50). This much-needed book is not a technical treatise on building, but an interestingly written work for the general reader who sees skyscrapers going up all about him and wants to know the why and the wherefore of some of the procedure.

Engineering
Science News-Letter, February 2, 1929

THE RADIO MANUAL—George E. Sterling, edited by Robert S. Kruse—*Van Nostrand* ($6). A good-sized book (of 654 pages) that discusses the general theory and practice of radio and answers specific questions on the installation, upkeep, operation and control of radio apparatus, both for transmission and reception. Broadcasting, marine radio, trans-oceanic communication and all other branches are included. Much of this specialized information is not available in any other book, so it is an invaluable reference work for anyone who is interested in radio.

Radio
Science News-Letter, February 2, 1929

A B C OF AVIATION—Victor W. Page—*Henley* ($1). Though inexpensive, this is a very complete and concise account of aviation and its terminology, both with heavier and lighter-than-air craft. Unusually clear and numerous drawings and diagrams completely explain each point.

Aviation
Science News-Letter, February 2, 1929

CHEMICAL PUBLICATIONS: THEIR NATURE AND USE—Melvin Guy Mellon—*McGraw-Hill* ($1.50). The chief purpose of this work is to introduce the chemical student to the technical journals of his field, to show him what is in them and how to make use of them to get out what he desires. In this it will fill a long-felt need and one that is still to be covered in other fields of science.

Chemistry
Science News-Letter, February 2, 1929

CHEMICAL REACTIONS OF THE PHOTOGRAPHIC LATENT IMAGE: VOL. I—E. R. Bullock—*Van Nostrand* ($2.50). Another volume in the series of monographs on the theory of photography, produced by the Eastman Research Laboratory under the editorship of Dr. C. E. K. Mees. It deals with silver-oxidizing baths, the chemical potential necessary for the destruction of the latent image, the silver germ theory and the silver sulfide germ theory, *inter alia*.

Photography—Chemistry
Science News-Letter, February 2, 1929

SOLUBLE SILICATES IN INDUSTRY—J. G. Vail—*Chemical Catalog Co.* ($9.50). Silicates have come into very extensive industrial use for adhesives, sizes, glazes and a host of other things that call for colloids and gels. This condensation of the essential data of the chemistry and physics of these compounds into a single compact volume will be welcomed by chemists and technologists.

Industrial Chemistry
Science News-Letter, February 2, 1929

THE SUN—Charles G. Abbot—*Appleton* ($3.50). For many years this book by the Secretary of the Smithsonian Institution, and one of America's leading astronomers, has been a classic in its field, but recently it has been limited in utility by the fact that it was not entirely up to date. In this revised edition he still covers the same ground, of the sun and its relation to the earth and the universe in general, and he has included extensive new material, much of it a result of his own researches.

Astronomy
Science News-Letter, February 2, 1929

W. H. HUDSON: BIRD-MAN—Harold Goddard—*Dutton* ($1). A chapter of appreciation, rather than a biography, of a charming and elusive personality.

Biography
Science News-Letter, February 2, 1929

WOODY PLANTS OF ALABAMA—R. H. Harper—*Geol. Survey of Alabama, University, Ala.* (free). A fully annotated list of the trees, shrubs and vines found in Alabama, with discussions of their local distribution and economic uses, well illustrated with half-tones of habit studies and with distribution maps. The author, who has devoted his life to the study of the botany of the Southeast, here makes a worthy addition to the growing literature of state floras available to the botanist and forester.

Botany
Science News-Letter, February 2, 1929

DEFORESTED AMERICA — G. P. Ahern—*Washington* (20c). A pamphlet crammed with disquieting facts about the rate at which lumberers are cutting off our remaining timber supply and the rate at which they are *not* taking steps to replace it.

Forestry
Science News-Letter, February 2, 1929

PLANT PHYSIOLOGY—V. I. Palladin; translated and edited by B. E. Livingston. Third Edition—*Blakiston* ($4). In this new edition of Palladin, which has now become the standard and almost universally used plant physiology text in this country, Dr. Livingston has followed the practice he initiated in the second edition of bringing the book down to date by means of ample supplementary notes, without altering the original text.

Plant Physiology
Science News-Letter, February 2, 1929

EDUCATIONAL BIOLOGY—W. H. Atwood and E. D. Heiss—*Blakiston* ($2.75). A textbook designed especially for the training of teachers. The type method is followed.

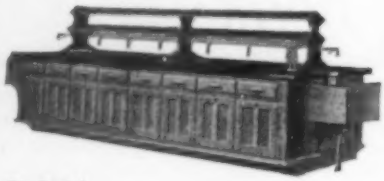
Biology
Science News-Letter, February 2, 1929

OUR VANISHING WILDFLOWERS—H. S. Salt—*Watts* (2s 6d). A discussion of the need for wildflower conservation, and especially for wildflower preserves, in Britain.

Botany
Science News-Letter, February 2, 1929

THE NATURALIST AT THE DINNER TABLE—E. G. Boulenger—*Duckworth* (6s). The director of the London Zoological Society's Aquarium indulges in some charming table-talk on the zoology of hors d'oeuvre, fish, joint, game, poultry, cheese. It makes one realize most strikingly how "around the earth each useful product flies."

Natural History
Science News-Letter, February 2, 1929



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First Glances at New Books—*Continued*

WHAT IS LIFE?—Augusta Gaskell—*Thomas* ($3.50). This book must be ticketed as philosophy rather than as biology, for its central thesis is frankly speculative. In addition to "material" atoms of the kind familiar to the physical scientist, the author's hypothesis envisages an entirely different category of "immaterial" entities composed of positively and negatively charged electrons in relations other than those obtaining in the groups we know as atoms. These "Z-system" units are assumed to have power to influence atoms, to capture and drag them along, though they do not enter into chemical combination with them. A material atom, or group of atoms, thus captive to a Z-system unit, is endowed with life. When the Z-system unit becomes separated from its material train, the latter becomes subject to autolytic processes and "dies". The Z-system unit would thus appear to be a species of entelechy, reduced to atomic or subatomic magnitude.

Philosophy
Science News-Letter, February 2, 1929

THEORY OF PROBABILITY—William Burnside—*Macmillan* ($3.50). A posthumous publication of the distinguished mathematician of Cambridge University. The obituary by Dr. A. R. Forsyth for the Royal Society is also included.

Mathematics
Science News-Letter, February 2, 1929

SOME MORE MEDICAL VIEWS ON BIRTH CONTROL—Edited by Norman Haire—*Dutton* ($2.50). Eleven doctors give their opinions of birth control, chiefly from the medical rather than the sociological standpoint.

Medicine—Sociology
Science News-Letter, February 2, 1929

CONSECRATIO MEDICI AND OTHER PAPERS—Harvey Cushing—*Little, Brown & Co.* ($2.50). The book is a collection of papers on medical subjects charmingly written and of sufficiently broad interest to appeal to many besides physicians and medical students.

Medicine
Science News-Letter, February 2, 1929

HERE WE GO ROUND—Evelyn Sharp—*Morrow* ($1). Tracing man's evolution by way of the dance is the interesting theme of this small volume, which is really a history of the dance from the first one performed ceremonially by a caveman to modern jazz.

Evolution
Science News-Letter, February 2, 1929

THE ORIGIN OF CIVILIZATION—G. Elliott Smith—*Morrow* ($1). A well-known British champion of the diffusion theory of civilization describes the progress made in ancient Egypt and the scattering of that progress through the Mediterranean area and the East. The theory carried to its ultimate limits leads to the startling suggestion that America got its ideas of pyramid building from the East. In view of the increasing evidences of the antiquity of Mayan culture, it is rather hard to accept Dr. Smith's statement: "It was not until the sixth or seventh century A. D. that the great stone pyramids of Cambodean and Javanese types were constructed in America." Nevertheless, an interesting little book, and a thought provoking one, perhaps especially so where the reader may not agree with the author.

Ethnology
Science News-Letter, February 2, 1929

EMOTION AS THE BASIS OF CIVILIZATION—J. H. Denison—*Scribner* ($5). The power of an emotion to direct the destiny of a group of human beings has been too little considered. This valuable addition to social psychology brings together evidence from the civilization of China, Rome, and other people of the past, as well as our own present-day emotional trends. The scope of the book cannot be put into words better than those of the author's preface, where he expresses the desire "to indicate the vast influence of emotions on social organization, and the necessity of determining what emotions can be used today to support our democratic institutions and to advance civilization; and further to suggest an inquiry as to whether the emotional cultures now in use are helpful or harmful, and as to what methods can be used to create and maintain the emotions which are found to be necessary".

Sociology—Psychology
Science News-Letter, February 2, 1929

DARWINISM AND WHAT IT IMPLIES—Sir Arthur Keith—*Watts* (7d). The main facts about evolution and a brief discussion of their philosophical implications condensed into a 56-page paper-bound book offered at almost nothing a copy. Sir Arthur Keith's signature is surety enough that the quality of the discussion is of the highest, even though the price be of the lowest.

Evolution
Science News-Letter, February 2, 1929

Volcano Expert Forecasts Eruption

Volcanology

Hawaii may expect an eruption of either Kilauea or Mauna Loa, its two largest volcanoes, in 1929.

This is the prediction made by Dr. Thomas A. Jaggar, director of the Hawaiian Volcano Observatory, maintained by the U. S. Department of the Interior. For many years Dr. Jaggar has kept careful watch on these volcanoes. Upon this study and the records of volcanic eruptions during the nineteenth century, he has based his prediction.

"In 1912," he said, "I wrote that Mauna Loa should become active before 1915; it broke out in 1914. In 1917 I wrote that a great crisis in Hawaiian volcanism should come around 1920; both Kilauea and Mauna Loa had flank outflows within the twelvemonth preceding July 1, 1920, and a great explosive crisis came in 1924. In 1923 I wrote that the nine-year cycle following 1913 would probably be unusually long and representative of the long-term intervals such as 1868 and 1790 had illustrated; the 1924 engulfment accompanied by shore collapse at Kapoho was a close parallel to 1868."

Japanese, Italian, Hawaiian and Caribbean volcanoes show that 130 years approximately is a common interval between big eruptions or earthquakes near eruptive centers, or both, he pointed out. However, he said, Vesuvius and Kilauea both show a minor interval of nine or ten years between eruptions, and the larger volcanoes, Etna and Mauna Loa, average their outbreaks at four or five-year periods.

"It is not permissible to say that Kilauea and Vesuvius shall break out every nine years, or Mauna Loa and Etna every four and a half years," Dr. Jaggar stated. "A volcano is not a clock. The interval theory is based on averages, and the averages are based on certain laws of nature such as those that determine the space intervals of ripple marks in the sands of the sea or the time intervals of waves when they break rhythmically on the beach.

"The lava under a volcano has been pressing upward for ages through a crack of a certain size. It has blocked or impeded that crack with its own heap of lava and so has forced itself to adopt a rhythm or interval like the puffs from a steam engine. If it has several vents, these divide responsibility for the interval, and if one vent is low and close to the water table, while the other is high and far above the ground water of the island the probability of explosion is greater for the lower vent. This is because a sudden drop in the lower vent may place the lava column below the water table and so develop a steam chamber. This is the situation of Kilauea as compared with Mauna Loa."

Science News-Letter, February 2, 1929

Echo Tells Position

Physics

Methods of locating a ship's position by means of automatic radio signals sent out from shore stations upon the receipt of a sound signal through the water from the ship have now reached a high degree of perfection and dependability. This is the announcement made by Col. E. Lester Jones, director of the U. S. Coast and Geodetic Survey, in his annual report.

Depth measurements are made by the survey's ships with the echo sounding device. A sound wave travels to the bottom, is reflected back and the time taken indicates the depth. In order properly to locate the position, however, it is necessary to know the position with respect to fixed points that can be identified on maps. With radio this can be done at night or in cloudy weather.

"In radio acoustic sound ranging," said Col. Jones, "a sound is produced at the survey ship which travels through the water to two or more shore stations, which automatically send wireless signals to the ship as soon as the sound arrives. This gives a measure of the distance of the ship from each station. Knowing the location of the two stations from previous surveying, the three sides of a triangle are known from which the ship's position can be computed."

Science News-Letter, February 2, 1929

Viking Art on Christian Churches

Archaeology

In old churches in Norway, built by the Vikings for the worship of the Christian God, there may be seen strangely incongruous carvings representing the pagan myths of the Norsemen, Ben Blessum of New York stated in a lecture before the Archaeological Society of Washington.

Sigurd's adventures with the dragon, as made famous in one of the old Norse sagas, are clearly portrayed in churches built about the end of the Viking period. The only plausible explanation seems to be that these wood carvings had originally been the portals and door jambs of temples to Odin and Thor and that they were transferred intact to Christian churches, the speaker said.

Mr. Blessum, who is himself a Norwegian, described medieval farmsteads in Norway which are still standing. Doors of these Viking homes are so low that one must stoop to enter. In the middle ages, if a visitor threatened to make trouble, this gave the man of the house a chance to make effective use of an axe on the intruder's head.

The history of the Vikings was written chiefly by the people that they conquered, and that is why they have been given such a reputation for being uncouth, lustful savages, he pointed out. Yet evidence found in their own country refutes this view and shows that they had attained a high degree of culture at a time when the rest of Europe was in the Dark Ages. The Vikings established the first overseas trade that England had. They had an excellent legal system. They lavished art on everything that they used, from houses to horse collars.

Until a merchant ship that had been sailed by the Vikings was discovered at Gokstad, in 1881, there was much controversy as to whether Lief Ericsson could have sailed across to America in the tenth century, or whether "Vinland" was really some unknown coast nearer home. The Gokstad ship, dating back to about 900 A. D., proved that they had a means of transportation equal to such a voyage, Mr. Blessum said. In 1893 inexperienced sailors took a boat made like it and successfully sailed to America. The Vikings were in touch with the world, even the new world of America, the speaker declared.

Science News-Letter, February 2, 1929

California's gold was never worked or mined by the Indians.

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